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OPTICAL RECORDING MEDIUM

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Specification

1. Title of the invention

Optical Recording Medium

2. Claims

1. An optical recording medium, characterized by the fact that a resin material composed of at least one of tocopherol and its derivative, an inorganic dye, and a resin in which at least one of these inorganic dye and tocopherol and its derivative is dispersed is installed on a support.

2. The optical recording medium of Claim 1, characterized by the fact that the inorganic dye is a benzoyl leucomethylene blue.

3. Detailed explanation of the invention

(Technical field of the invention)

[1] Numbers in the margin indicate pagination in the foreign text.

The present invention pertains to a recording medium being used in optical disk recording and reproducing devices, for instance.

(Prior art)

As a conventional disk-shaped recording medium (hereinafter, abbreviated to a disk) being used in optical disk devices, there are disks being used to copy a large amount of video disks for reproducing only and PCM audio disks and disks in which a recording medium is deposited on the surface of a substrate such as glass and plastic being used in devices having a recording function. The disk of the present invention is a disk being used in the device having a recording function. Figure 1 is a schematic diagram showing a device for writing information into a conventional disk. In the figure, (1) is a disk, (2) is a support, (3) is a light-absorbing layer, (4) is a laser beam, and (5) is an object lens. As shown in the figure, the disk (1), representatively, is realized as a light-absorbing layer (3) by forming a metal vapor-deposited film such as tellurium on the surface of the support (2) such as glass and plastic with a thickness of 1 mm.

The optical disk recording and reproducing device is a device for recording and reproducing information using a laser beam. However, in the device having a recording function, the

laser beam (4) is condensed on the surface of the metal vapor-deposited film (3) as a light-absorbing layer while rotating the disk (1), and the laser beam is modulated by the information to be written, so that the information is written in a shape, in which a hole is opened by a thermal working, into the metal vapor-deposited film (3). Since the metal vapor-deposited film such as tellurium can obtain preferable characteristics such /2 as good S/N ratio and little information drop called a drop-out, in particular, in recording by a low-power laser such as semiconductor laser, for example, a metal with a low melting point such as tellurium is often used as such a light-absorbing layer. However, in the conventional disk being used as a light-absorbing layer in which the metal with a low melting point such as tellurium is vapor-deposited, the metal such as tellurium is easily oxidized, and along with the progress of the oxidization, the reflectance of a light is reduced, so that the recording sensitivity is slowly deteriorated.

(Outline of the invention)

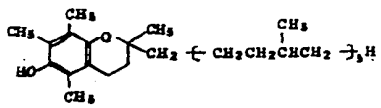
The present invention removes the drawbacks of the above-mentioned prior arts, and its purpose is to provide an optical recording medium, which can be recorded, even at a low power, by installing a resin material composed of at least one of tocopherol and its derivative, an inorganic dye, and a resin in

which at least one of these inorganic dye and tocopherol and its derivative is dispersed on a support.

(Application example of the invention)

Figure 2 is a schematic diagram showing a device for writing information into the optical recording medium of an application example of the present invention. In the figure, (1)-(5) are the same as those of Figure 1. (6) is a colorless dye, and (7) is at least one of tocopherol and its derivative.

As the tocopherol and its derivative of the present invention, there are α-tocopherol, β-tocopherol, γ-tocopherol, δ-tocopherol, 5,7-dimethyl tocol, 7-methyl tocol, 5-methyl tocol, α-tocotrienol, β-tocotrienol, γ-tocotrienol, δ-tocotrienol, tocotrienol, α-tocopherol acetic ester, d-α-tocopherol succinate, tocopheramine, α-tocopherothiol, α-tocopherothioacetic acid, α-tocopherodisulfide dimmer, α-tocophero selenium acetic acid, di-α-tocophero diselenide, etc. As an example of the chemical structural formula, the structure of α-tocopherol is shown below.



As the inorganic dye of the present invention, there are benzoyl leucomethylene blue, leuco Malachite green, crystal violet lactone, Rhodamine B lactam, etc.

As the resin of the present invention, there are methyl polymethacrylate (PMMA), ethyl polymethacrylate, polystyrene, vinyl polychloride, etc.

As the support of the present invention, there are glass, quartz plate, plastic, etc.

Also, in case recording is carried out using the optical recording medium of the present invention, the inorganic dye of the optical recording medium is made chromogenic by irradiating an ultraviolet ray to the optical recording medium of the present invention. Next, in reading the record, for example, a light with a wavelength corresponding to the above-mentioned chromogenic color is transmitted. Also, if the support has a large reflectance, the recorded information can be read out by a reflected light.

Next, the present invention is explained by application examples, however the present invention is not limited to them.

Application Example 1

α-tocopherol at 1 part by weight, inorganic dye benzoyl leucomethylene blue at 1 part by weight, and PMMA at 3 parts by

weight were dissolved in acetone at 92 parts by weight. It was coated at a final thickness of 10 μm on a glass disk with a diameter of 30 cm by Hoera[transliteration] and dried at room temperature, so that an optical recording medium was obtained. It was recorded by focusing an ultraviolet ray (an optical strength of 2 mw/cm^2) a spot of 10 μm and irradiating it to its light-absorbing film by a device shown in Figure 2. Next, a light of 650 nm was irradiated by a device for reading the information written into the optical recording medium of the application example of the present invention as shown in Figure 3, and the change of the transmitted light was measured. In the figure, (1)-(7) are similar to those of Figure 2, and (8) is a light source, (9) is a monochromator, and (10) is a photodetector. As a result, assuming that the absorbance of the part irradiated with the ultraviolet ray was R1 and the absorbance of the non-irradiated part was R2, the contrast ratio was defined by the following equation.

/3

In other words, the contrast ratio = R1 - R2/R1 + R2. As a result, the contrast ratio was 0.4.

Application Example 2

α-tocopherol acetic ester at 1.5 parts by weight, inorganic dye Rhodamine B lactam at 0.5 part by weight, and ethyl

polymtehacrylate at 8 parts by weight were dissolved in methyl ethyl ketone at 92 parts by weight. It was spin-coated at a final thickness of 20 μm on a glass disk with a diameter of 30 cm and dried at room temperature, so that an optical recording medium was obtained. It was recorded by irradiating an ultraviolet ray using the device shown in Figure 2. Next, a light of 540 nm was irradiated similarly to the above application example, and the change of the transmitted light was measured. As a result, the contrast ratio was 0.5.

From the contrast ratio values of the above application examples, it was understood that the recording using the optical recording medium of the present invention could be discriminated and used.

(Effects of the invention)

As explained above, according to the present invention, with the use of the optical recording medium in which a resin material composed of at least one of tocopherol and its derivative, an inorganic dye, and a resin in which at least one of these inorganic dye and tocopherol and its derivative is dispersed is installed on a support, recording is possible, even at a low power.

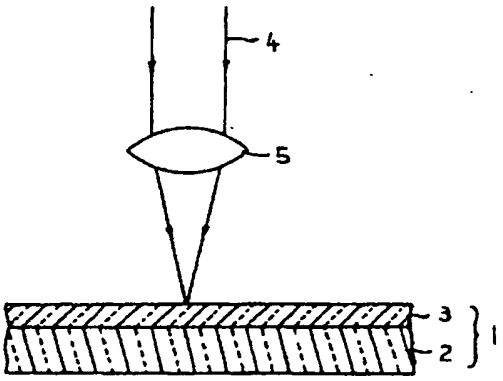
4. Brief description of the figures

Figure 1 is a schematic diagram showing a device for writing information into a conventional disk. Figure 2 is a schematic diagram showing a device for writing information into the optical recording medium of an application example of the present invention. Figure 3 is a schematic diagram showing a device for reading the information written into the optical recording medium of an application example of the present invention.

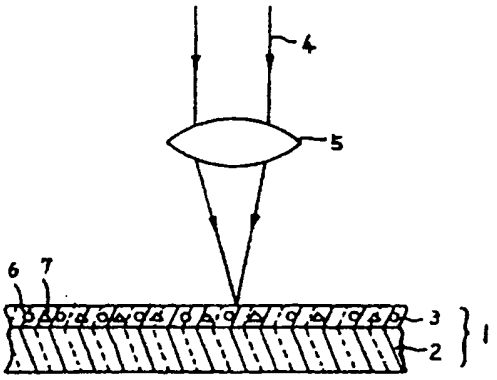
In the figures, (1)is a disk, (2) is a support, (3) is a light-absorbing film, (4) is a laser beam, (5) is an object lens, (6)is an inorganic dye, (7) is at least one of tocopherol and its derivative, (8) is a light source, (9) is a monochromator, and (10) is a photodetector.

Also, in the figures, the same symbols show the same or corresponding parts.

第 1 図



第 2 図



第 3 図